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MS 212  
Hampton, VA 23681-2199



### FAX Cover Sheet

To: USPTO Organization/Company: \_\_\_\_\_  
Fax: 703-872-9318 Phone: \_\_\_\_\_  
Subject: LAR 16220-1 - Serial No. # 09/696,527 Amendment Response

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From: Robin W. Edwards E-Mail: r.w.edwards@larc.nasa.gov  
Fax: 757-864-9190 Phone: 757-864-3230  
Date: 4/4/03 Pages: 18 (including this cover sheet)

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NASA Case No. 16220-1

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :  
Joycelyn S. Harrison et al. :  
Serial No.: 09/696,527 : Examiner: Medley, Peter M.  
Filed: September 23, 2000 : Art Unit: 2834  
For: MEMBRANE TENSION CONTROL

CERTIFICATE OF TRANSMITTAL

I hereby certify that this correspondence detailed below is being transmitted via facsimile to TC3700 at 703-872-9318 in care of the Commissioner of Patents and Trademarks, Washington DC 20231 on April 4, 2003.

Office Action Response - 6 pages  
Affidavit of Robin W. Edwards - 2 pages  
Affidavit of Joycelyn S. Harrison - 2 pages  
Affidavit of Ji Su - 2 pages  
Extension of Time - 2 pages  
Notice of Appeal - 1 page  
Fee Transmittal - 2 pages

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Date: 4/4/03

Tina Hawks Buchanan  
Tina Hawks Buchanan

AMENDMENT

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

In response to the Office Action dated October 8, 2002, please amend the above-referenced patent application as follows:

In the Claims:

Please amend Claim 6 as follows:

6. (Amended) A membrane structure, comprising:  
a membrane whose position is to be controlled;  
a supporting frame;  
a plurality of threads connecting the membrane to the supporting frame; and  
an electrostrictive polymer actuator integrated into at least one thread, the electrostrictive polymer actuator having a longitudinal axis that is substantially aligned with the axis of the thread;  
wherein the electrostrictive polymer actuator displaces along its longitudinal axis, thereby affecting movement of the membrane structure; and  
wherein the electrostrictive polymer actuator comprises:  
an electrostrictive polymer having a tailorable Poisson's ratio, wherein the electrostrictive polymer is electroded on its upper and lower surfaces;  
an upper material layer bonded to the upper electroded surface of the electrostrictive polymer, wherein the electroded electrostrictive polymer and upper material layer form a bonded assembly, wherein the bonded assembly is rolled into a roll having two ends, and further wherein entire adjacent surfaces within the roll contact one another; and  
a cap affixed to each end of the roll.